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ABSTRACT

A study examined the long-term adjustment of spinal cord-injured vocational rehabilitation clients by isolating major dimensions of postservice adjustment, correlating preservice status with adjustment followup, and by measuring client pre- to postservice psychological change. Three self-report instruments (a needs satisfaction inventory, a goal scaling measure, and a measure of perceived life status) were completed at service entry by 122 clients of various Arkansas intermediate medical centers or comprehensive rehabilitation centers. Included among the major study findings were the following: (1) postservice adjustment to spinal cord injury is clearly multidimensional and spans at least four major dimensions--satisfaction in meeting basic needs, participation in vocational activities, participation in avocational activities, and accomplishment of highly personal goals; (2) there were no relationships of preservice psychological status to adjustment followup; (3) clients' psychological status remained stable from service entry to followup; and (4) at followup a significant number of spinal cord-injured clients positively revised their life status perceptions toward personally important goals. (MN)

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Postservice Psychosocial Adjustment of Former Spinal Cord Injured Rehabilitation Clients

Research Report

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Arkansas Division of Rehabilitation Services

January, 1982

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Abstract

This study examined the long-term adjustment of spinal cord injured vocational rehabilitation clients by isolating major dimensions of postservice adjustment, correlating preservice status with adjustment at follow-up, and by measuring client pre- to postservice psychological change. Three self-report instruments, a needs satisfaction inventory, a goal scaling measure, and a measure of perceived life status were completed by clients at service entry. Clients again completed those instruments and a follow-up questionnaire 38 to 52 months after service entry. Key findings include the description of four adjustment dimensions: satisfaction in meeting prepotent necessities, vocational self-esteem, general life satisfaction, and participation in avocational activities. There were no relationships of preservice psychological status to adjustment at follow-up. Clients' psychological status remained stable from service entry to follow-up. At follow-up a significant number of SCI positively revised their life status perceptions toward personally important goals.

Postservice Psychosocial Adjustment of Former
Spinal Cord Injured Rehabilitation Clients

Given the medical ramifications of spinal cord injury, it is not surprising to note that the bulk of the research has considered medical problems related to the impairment. Advances in medical technology and the fact that many spinal cord injured can now be expected to exhibit near normal mortality rates have increased interest in psychosocial adjustment and outcomes. Reviews (Cook, 1976; McDaniel, 1976; Trieschmann, 1978; Woodbury, 1978) of the adjustment to spinal cord injury literature have pointed out that much of the empirical research on psychosocial adjustment to SCI has been limited to the artificial environment of the hospital or rehabilitation center. Indeed, only 20 postservice follow-up studies (Cook, Bolton, & Taperek, 1980) have been conducted and published from 1954 to 1979. Most of these studies defined successful postservice adjustment as employment.

Three studies examined correlates of postservice adjustment. Frielich (1977) developed a five level index of postservice rehabilitation adjustment. His study suggested that at follow-up, marriage, higher income, functional independence, and injury at a younger age were related to better adjustment. There were no significant relationships between preinjury occupation, age, or living arrangements with adjustment at follow-up. Athelstan and Crewe (1979) found that an important correlate of postservice adjustment was the manner of onset of disability. Imprudent, or high risk takers were better adjusted than were persons who suffered injury as

innocent victims. Kemp and Vash (1971) defined postservice productivity as degree of participation in one or more of four activities: vocational, leisure, educational, and group membership. They reported that correlates of client postservice productivity included number of future goals expressed, age (negative if goals were not considered, positive when they are), creativity, and less attention given to physical loss.

Postservice adjustment is the sine qua non of rehabilitation services. However, adjustment to spinal cord injury is more likely to be multidimensional than categorical, and to contain elements of stability as well as of change. Therefore, this study was conducted to: 1) describe major postservice dimensions of adjustment to spinal cord injury, 2) relate client preservice motivational and psychological status to adjustment at follow-up, and 3) measure client pre to postservice psychosocial change.

Method

Subjects

The research population was 122 spinal cord injured clients who had participated in a state-wide Rehabilitation Services Administration sponsored service project (Cook, 1978) and had, at entry to either an intermediate medical center or a comprehensive rehabilitation center, completed select psychological inventories. At project entry, the follow-up sample was 71% male, 78% Caucasian, 45% single never married; 45% had one or more dependents. The sample had a median tenth grade education and 57% reported wages as the primary source of income preinjury. Median age equaled 26.

Median age at injury was 22. By level of injury, 65% were paraplegic, 35% quadraplegic. Auto accidents, gunshot wounds, and falls were the major causes of injury.

Procedure

Follow-up procedures included extensive attempts to locate these clients (N = 122) 38 to 52 months after project entry. Specific client location procedures were: search research files for client's last known forwarding address and phone number. Phone client. If unsuccessful, then search telephone directory of the city of forwarding address for the person's listing; if unsuccessful, then call directory information of the city of forwarding address for client's listing; if unsuccessful, search directory of the city of forwarding address for persons with same surname, inquire as to whereabouts of client.

The actual survey took the following form. Clients were alerted to expect a 27-item questionnaire and select inventories. The questionnaire, inventories, a self-addressed, stamped envelope, and a cover letter were mailed within two days after contact. If the materials were not returned after 10 days, a postcard reminder was sent. If after three weeks the follow-up materials still had not been returned, another set of materials was mailed.

Follow-up sample. Of the 122 persons, 5 were deceased, 16 had moved out of state, and 35 could not be located. Fifty-two returned the follow-up materials; 14 persons were located but did not return the materials. For persons located, but not deceased or out-of-state, the response rate equaled 79%; including clients not located, the response rate equaled 55%. The follow-up sample

was compared to the research population on 14 key demographic variables. The distributions across variables for the population and sample were very similar suggesting that the follow-up sample was representative of the research population.

Measures

Adjustment Index. The survey questionnaire was designed to assess clients' perceptions of their adjustment. Questionnaire development followed well known principles (Dillman, 1978) and was designed to assess client vocational, educational, socio-economic status, satisfaction with services, and future needs. Based on a previous factor analysis of questionnaire items completed by a larger sample (N = 144) of SCI clients (Cook et al., 1980) a standard score adjustment index had been constructed. The index measured four dimensions of postservice adjustment to spinal cord injury: help needed in activities of daily living (ADL; common variance = .39), time spent in avocational activities (common variance = .22), perception toward general physical and mental health (common variance = .23), and vocational activity (common variance = .16). Vocational activity included competitive employment, homemaking, unpaid family work, and schooling.

Human Service Scale. Reagles, Wright, and Butler (1974) developed the 80-item multiple choice Human Service Scale (HSS) specifically for rehabilitation concerns. The HSS is based on Maslow's (1954) hierarchy of needs although HSS factor structure suggested seven needs: Physiological, Emotional Security, Economic Security, Family, Social, Economic Self-esteem, and Vocational Self-actualization, rather than the five needs identified by Maslow;

also the HSS need configuration is contiguous and spherical rather than hierarchical and linear. Reagles and Butler (1976) report Hoyt reliability coefficients ranging from .69 to .97. High scores reflect relative need fulfillment.

Life Ladder Scale. The Life Ladder Scale (Cantril, 1965) is a 10-point self-anchoring, semi-projective technique whereby persons rank their present, future (five years from now) and past (five years ago) with regard to their best and worst possible life. The scale is sensitive to changes in personal circumstances and is widely used as a measure of public opinion (Watts, 1981). In rehabilitation, the Life Ladder Scale has been used as a measure of client hope toward the future (Cook, 1981; Boone, Roessler, & Cooper, 1978) and as a measure of rehabilitation gain (Roessler, Cook, & Lillard, 1977).

Goal Scaling. Clients were given the goal they had chosen at program entry and asked to rate, at follow-up and on a four-point Likert scale their degree of goal accomplishment. Clients were also asked to choose a new goal from a list of 21 rehabilitation goals commonly cited as important by spinal cord injured persons (Cook & Roessler, 1977) and to estimate, on a scale of 0 to 100, their chance of accomplishing that goal within one to two years.

Results

Sixteen variables were used to describe the postservice adjustment of these spinal cord injured clients. All variables were intercorrelated (see Table 1) and reduced to a more manageable

Table 1

Intercorrelations of Postservice Adjustment Measures (N = 50)

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
HSS																
1. Physiological	1.00	.80	.55	.29	.42	.29	.29	.33	.35	-.03	.36	.01	.37	.31	.53	.18
2. Emotional Security		1.00	.34	.51	.52	.19	.29	.31	.43	.06	.47	.11	.36	.24	.45	.26
3. Economic Security			1.00	.10	.17	.21	.35	.28	.34	.03	.25	.04	.05	.02	.21	.24
4. Family				1.00	.33	.12	.19	.37	.39	.20	.39	.12	.03	.08	.28	.15
5. Social					1.00	.20	.33	.42	.45	.08	.28	.26	.34	.52	.54	.14
6. Economic Self-Esteem						1.00	.93	.33	.45	.01	-.33	.07	.25	.18	.26	.55
7. Vocational Self-Actualization							1.00	.35	.50	.02	.36	.14	.17	.27	.29	.62
Life Goals																
8. Future								1.00	.65	.24	.55	.32	.24	.45	.41	.41
9. Present									1.00	.47	.68	.31	.36	.22	.41	.39
10. Past										1.00	.31	.31	.20	.07	.04	.15
11. Goal Achievement (4 = accomplished)											1.00	-.28	.28	.16	.38	.22
12. Future Success												1.00	.14	.24	.29	.05
Rated Adjustment																
13. ADL													1.00	.35	.25	.15
14. Avocational														1.00	.39	.30
15. Health															1.00	.06
16. Vocational																1.00

$r.27 = .05$

$r.33 = .01$

$r.45 = .001$

form via a principal component, varimax rotation, factor analysis. Table 2 presents the factor structure for those 16 adjustment variables. Table 2 illustrates that the first principal component accounts for 35% of the variance of the 16 dimension space. Four rotated factors account for 65% of the total variance. Factor I loads mostly on the Physiological, Emotional, and Economic Security subscales of the HSS. Those scales purport to measure the degree of worry over financial problems, physical health symptoms, pain, anger, discouragement, and indecisiveness as they impact on day-to-day activities. Factor I appears to represent satisfaction with basic, lower ordered needs and can be labeled prepotent necessities. Factor II clearly suggests a vocational dimension, loading highest on the Economic Self-Esteem, Vocational Self-Actualization scales of the HSS (both scales were highly correlated, $r = .93$), and the vocational portion of the adjustment index. Factor II implies satisfaction with work as an activity rather than as an economic necessity. Therefore, Factor II may represent a dimension of vocational self-esteem. The Life Ladder and goal selection variables make the biggest contribution to Factor III. Because these variables are scaled differently from the HSS scales and the Adjustment Index, those loadings may reflect differences in method variance. However, the moderate loading on the Family need subscale provides some method redundancy and suggests that Factor III is tapping some form of general life satisfaction. That is, Factor III seems to reflect idiosyncratic judgments of where any one person has been, is now, and hopes to be relative to some personally important life goals. Factor IV loads highest on participation

Table 2

Factor Structure of Outcome Variable Scores

Variables	First Principal[1] Component	Varimax Rotation I	II	III	IV
HSS					
1. Physiological	.68	.81	.12	-.04	.39
2. Emotional Security	.72	.86	.07	.15	.31
3. Economic Security	.50	.71	.32	-.01	-.07
4. Family	.49	.48	-.01	.48	.04
5. Social	.65	.31	.07	.16	.73
6. Economic Self-Esteem	.60	.14	.90	.04	.13
7. Vocational Self-Actualization	.67	.18	.90	.07	.18
Life Ladder					
8. Future	.72	.21	.33	.53	.40
9. Present	.80	.32	.40	.70	.23
10. Past	.27	-.12	-.03	.79	.00
Adjustment Index					
11. ADL	.47	.12	.11	.15	.55
12. Avocational	.50	-.06	.19	.02	.83
13. Health	.63	.40	.05	.16	.62
14. Vocational	.52	.05	.77	.15	.08
Goals					
15. Goal Accomplished	.69	.40	.24	.64	-.13
16. Chance of Success	.35	-.14	.01	.53	.37
Proportion Total Variance	.35	.17	.17	.15	.16
Proportion Common Variance		.26	.26	.23	.25

[1]Eigen values for first eight principal components 5.66, 1.83, 1.70, 1.35, 0.97, 0.87, 0.77, 0.64

in avocational activities and the HSS social subscale. The high loadings on the health and activities of daily living subscales of the Adjustment Index are probably due to common method variance as well as the fact that persons who are better able to perform activities of daily living are less concerned with health problems are more likely to be socially active. Factor IV connotes the dimension of avocational activity.

Based on information obtained at project entry, earlier studies (Cook, 1981; 1979) classified these clients into diagnostic subgroups. Using the Mini-Mult, an abbreviated form of the MMPI, Cook (1979) formed three subgroups; psychological deniers, schizoids, and depressives. Cook (1981) then formed three homogeneous groups mostly on the basis of one motivational variable, goal choice and perceived importance of that choice. The three groups consisted of: 1) persons who chose an independence goal and said it was very important to accomplish; 2) persons who chose a psychosocial goal and said it was important to accomplish, and 3) persons who chose a psychosocial goal and said it was not very important to accomplish. There were no significant differences between the proportion of persons so classified at program entry and the proportion in the follow-up sample. Prior to analysis, each client's four Adjustment Index subscales were collapsed into one score. Multivariate analysis of variance (MANOVA) of all dependent variables (i.e., mean scores for the 13 outcome variables, see Table 1) across all independent variables (diagnostic subgroups) was nonsignificant, $F(104,926) = 0.74$. MANOVA comparisons for each independent variable across all dependent

variables were also nonsignificant (F's ranging from 0.75 to 1.28). In fact, out of 52 one-way ANOVA's only four, about what could be expected by chance, reached statistical significance. There were no significant relationships between psychological status at program entry and level of need satisfaction, self-perceived adjustment, life satisfaction, and goal accomplishment at follow-up.

Long term psychological change was analyzed two ways. First, mean pre and follow-up HSS and Life Ladder Scale scores were compared by paired t tests. Second, individual clients' changes were analyzed. Table 3 points out that five of the seven HSS scales showed significant mean score decreases in need satisfaction at follow-up. The practical significance of those differences is moderated by the fact that at follow-up all HSS mean scale scores were at or slightly above the mean norm scale scores for orthopedic rehabilitation clients provided by Reagles, Wright, and Butler (1974). Comparisons of pre-post mean Life Ladder future ratings were nonsignificant perhaps due to a ceiling effect. Changes in mean present (where I am now) and future (where I will be in five years) were significant and represent a dramatic shift in the way these SCI perceived their past and present life. Most Life Ladder ratings for people-in-general follow the progression of rating past life below present and present below future. However, at service entry, the ratings of these SCI, in that they rated past life above present and close to their best possible life, was different from the expected progression. At follow-up mean past (4.2), present (7.1), and future (9.0) ratings were more in line with mean rating trends of past (6.0, 4.6, 2.7), present (6.4, 6.2, 4.5) and future

Table 3

Pretreatment to Follow-up Change Analyses (n=47)

Variables	Aggregate Analysis			Individual Change Analysis					
	Pre $\bar{X}$'s & (S.D's)	Post $\bar{X}$'s & (S.D.'s)	Paired t test	Pre-post r	Change Score Confidence Interval	Increased	Same	Decreased	Chi-Square[1]
HUMAN SERVICE SCALE									
1. Physiological	88.5 (13.5)	86.2 (15.0)	1.56	.48	±14.63	2	35	10	83.22**
2. Emotional	118.3 (20.9)	111.8 (24.1)	2.64*	.54	±20.05	4	32	11	112.76**
3. Economic Security	23.9 (8.2)	20.7 (8.9)	3.04**	.52	± 9.90	2	35	10	83.22**
4. Family	52.1 (12.5)	50.6 (11.0)	1.68	.60	±12.19	5	33	9	82.22**
5. Social	37.5 (10.4)	33.1 (9.5)	3.56**	.51	±14.09	1	39	7	36.80**
6. Economic Self Esteem	23.9 (10.3)	19.6 (11.7)	2.21*	.23	±24.18	3	41	3	8.36*
7. Vocational Self Actualization	58.7 (37.9)	44.5 (35.0)	2.23*	.14	±46.54	0	46	1	N.S.
LIFE LADDER									
8. Future rating	9.4 (1.8)	9.0 (3.2)	0.91	-.08	±4	3	37	7	41.73**
9. Present rating	5.1 (2.8)	7.1 (3.1)	3.56**	.31	±3	16	27	4	241.20**
10. Past rating	7.6 (2.7)	4.2 (2.9)	6.03**	-.07	±4	3	18	26	645.20**

[1] Theoretical distribution for individual change scores @ $P \leq .05$ is 1/45/1.

* $p < .01$

** $p < .001$

(7.3, 8.1, 7.5) for the United States population (Watts, 1981), college students (Kilpatrick & Cantril, 1960), and nonspinal cord injured rehabilitation clients (Roessler & Boone, 1977), respectively.

In order to study the degree of individual change, HSS difference score reliabilities were determined by a formula suggested by Stanley (1971, p. 387). Using HSS change score reliability estimates, standard errors of measurement were established and confidence intervals about the raw change scores were developed. Reliability coefficients for the Life Ladder are not available; therefore, confidence intervals were defined as one standard deviation either side of the raw change score mean. Table 2 presents the number of individuals who increased, stayed the same, or decreased on each of the scales. Chi square analysis was used to test the goodness of fit of the change score frequencies to the theoretical expected distribution where change scores only reflect errors of measurement.

In general, individual change analyses support the aggregate analyses and point out the stability of HSS need satisfaction. On the HSS most (75%) stayed the same, an average of 2.4 persons increased their scores, an average of 7.2 persons decreased their scores. Four people, or nine percent of the sample significantly decreased their scores at follow-up on three or more of the scales. Presumably those persons were experiencing the most problems in adjustment. Sixteen people perceived their present life to be significantly better than they did at service entry. At follow-up, 26 SCI perceived their past as being closer to their worst possible life. At service entry these same persons tended to perceive their past as closer to their best possible life suggesting that at

service entry they associated their past with preinjury status. Three to five years postservice, past ratings might reflect a more realistic postinjury appraisal. If so, ratings of past and present for these SCI with regard to life status at program entry, reflect significant change.

Discussion

Adjustment to spinal cord injury is clearly multidimensional in nature. The results of this study suggest four adjustment dimensions are necessary but probably not sufficient, to describe postservice adjustment. The first dimension, prepotent necessities, suggests some level of satisfaction in obtaining such basic things as shelter, adequate financial resources, and food. Bolton (1977) has noted that the highest loading HSS subscales on this dimension, Physiological and Emotional Security, are highly related to client psychopathological symptomatology. The second dimension, vocational self-esteem, reflects importance of work as an activity in and of itself. Because at follow-up only 10% of these clients received primary income from wages or salaries, employment probably provides such noneconomic benefits as self-esteem, self-respect, activity, and social interaction. The third factor, general life satisfaction, seems to be the most idiosyncratic of the four dimensions. That factor mirrors the common sense notion that movement toward, and accomplishment of, personally relevant goals is a facet of overall adjustment. The fourth factor, avocational activity, appears to be a straight-forward aspect of adjustment. Those SCI who are less concerned with health problems are more apt to participate

in, and derive benefit from a wide range of avocational pursuits. Given these dimensions of adjustment and a large population of SCI, it should be possible to rank-order persons on the various dimensions thereby determining who is in need of specific service interventions.

Given the relevance of the goal choice/goal importance motivational variable in forming clear-cut subgroups of SCI clients (Cook, 1981), the lack of relationship of client group membership to postservice adjustment is perplexing. This is especially so because goal choice was very stable; few clients changed their goals at follow-up, no client chose a goal in a different category at follow-up. Locke, Shaw, Saari, and Lutham (1981) have suggested several reasons for the lack of relationship between goal choice and adjustment at follow-up, including: 1) clients may have chosen goals based on what they hope for and not what they could reasonably expect to achieve, 2) the goals clients chose were non-specific, consequently clients may have lacked knowledge of clear-cut strategies to achieve their goals, and 3) the degree of client commitment to change was not ascertained.

Analysis of individual HSS change scores revealed that most (75%) SCI were, within the margin of errors of measurement, stable in need satisfaction. The proportion of persons who increased, stayed the same, or decreased were not significantly different from the proportions reported by Bolton (1979) for a sample of mixed disability rehabilitation clients over 20 psychological variables. Also, Thompson and Dexter (1980) reported no significant changes on the scales of the MMPI for a sample of SCI one

year after initial testing. These findings support Shontz's (1971) contention that within disabled populations, psychological disorganization is transient, and personality characteristics are stable. Finally, client ratings on the Life Ladder at follow-up suggested that relative to these clients' perceived worst and best possible lives at service entry, 55% now saw their past as closer to their worst possible life; a significant re-evaluation in that at service entry most viewed their past as closer to their best possible life. At follow-up, about one-third (34%) saw their present situation as significantly closer to their best possible life.

Conclusions

The results of this study have several implications. First, postservice adjustment to spinal cord injury is clearly multidimensional and spans at least four major dimensions: satisfaction in meeting basic needs, participation in vocational activities, participation in avocational activities, and accomplishment of highly personal goals. Given the wide range of adjustment opportunities within those dimensions, Trieschmann's (1974) suggestion that the process of rehabilitation be individualized and "adjustment" judged at the level of each individual's capabilities, is particularly relevant. Second, the importance of such psychological variables as depression, anxiety, and denial in relation to postservice adjustment appears to be overemphasized, at least for SCI clients entering intermediate or long-term rehabilitation. Third, the results of this study, in conjunction with previous research suggest that psychological adjustment is, for most SCI, stable. Fourth, at service entry, most clients hold negative perceptions toward important life goals. Over time and presumably in relation to rehabilitation treatment, it is likely that positive changes in those perceptions will occur.

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